O Level Pure Chemistry MCQs

The Mole Concept and Stoichiometry Test 5.0

Q1

Zinc oxide is produced by heating zinc carbonate.

$$ZnCO_3 \rightarrow ZnO + CO_2$$

What is the percentage yield of zinc oxide if 125 g of zinc carbonate on heating produces 75 g of zinc oxide?

A $125 \times \frac{81}{75} \times 100$

B $125 \times \frac{75}{81} \times 100$

C $\frac{81}{75} \times 100$

D $\frac{75}{81} \times 100$

Q2

Ethane burns completely in oxygen as shown in the equation.

$$2C_2H_6\ (g) + 7O_2\ (g) \rightarrow 4CO_2\ (g) + 6H_2O\ (l)$$

If 10 cm^3 of ethane is burnt in 50 cm^3 of oxygen, calculate the volume of the gaseous mixture obtained at the end of the reaction, measured at room temperature and pressure.

A 20 cm^3
B 35 cm^3
C 50 cm^3
D 65 cm^3

Q3

Tin is extracted from its ore cassiterite (which contains SnO_2) by reducing it with coal in a furnace according to the equation.

$$SnO_2 + 2C \rightarrow Sn + 2CO$$

What is the percentage purity of the tin ore if 600 g of cassiterite on reduction produces 82 g of tin? (M_r of SnO_2 = 151, A_r of Sn = 119)

A $\frac{82}{119} \times \frac{600}{151} \times 100$

B $\frac{82}{119} \times \frac{151}{600} \times 100$

C $\frac{119}{82} \times \frac{600}{151} \times 100$

D $\frac{119}{82} \times \frac{151}{600} \times 100$

Q4

Carbonyl sulfide (COS) burns in air forming carbon dioxide and sulfur dioxide according to the reaction as shown:

$$2COS(g) + 3O_2(g) \rightarrow 2CO_2(g) + 2SO_2(g)$$

What is the volume of the resulting gas mixture when 6 dm^3 of carbonyl sulfide and 6 dm^3 of oxygen are burnt?

A	8 dm^3	**B**	10 dm^3
C	12 dm^3	**D**	14 dm^3

Q5

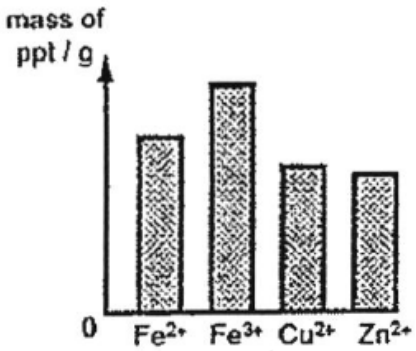
A solution of $FeSO_4.(NH_4)_2SO_4.6H_2O$ has a concentration of 0.0500 mol/dm^3. What is the concentration in mol/dm^3 with respect to SO_4^{2-} ions?

A	0.0250 mol/dm^3	**B**	0.0500 mol/dm^3
C	0.100 mol/dm^3	**D**	0.200 mol/dm^3

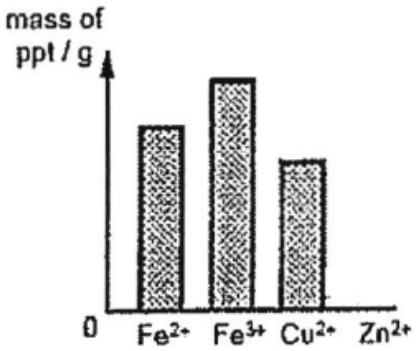
Q6

Four separate solutions are prepared so that each solution contains 1 g of one of the following ions, Fe^{2+}, Fe^{3+}, Cu^{2+} and Zn^{2+}. To each solution an excess of sodium hydroxide solution is added and the mass of any resulting precipitate is found. Which one of the following diagrams, **A**, **B**, **C** or **D**, illustrates the results?

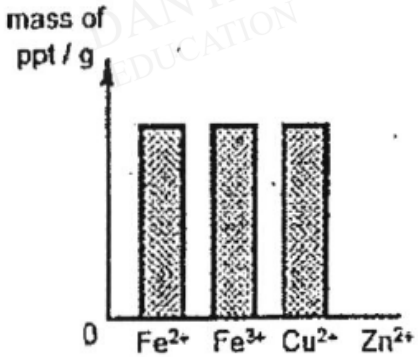
A



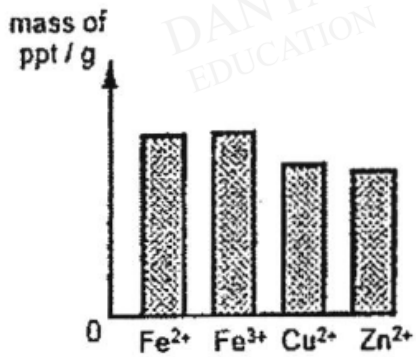
B



C



D



Q7

256 g of sulfur vapour has the same volume as 32 g of oxygen gas at the same temperature and pressure.

What is the molecular formula of sulfur?

A S B S_2 C S_4 D S_8

Q8

What volume of gas, measured at room temperature and pressure, remains if 60 cm^3 of sulfur dioxide reacts with 20 cm^3 of oxygen to form sulfur trioxide?

$$2SO_2\,(g) + O_2\,(g) \rightarrow 2SO_3\,(g)$$

A 20 cm^3 B 40 cm^3 C 60 cm^3 D 80 cm^3

Q9

12 dm^3 of polluted air is passed through limewater so that all the carbon dioxide is precipitated as calcium carbonate. The mass of calcium carbonate formed is 0.05 g.

What is the approximate percentage by volume of carbon dioxide in the air sample?

A 0.001% B 0.05% C 0.10% D 0.50%

Q10

Zinc reacts with sulfuric acid as shown below.

$$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$$

Two identical samples of zinc with the same mass were reacted with separate samples of excess acid as follows:

Reaction 1 : zinc added to 1.0 mol/dm^3 sulfuric acid

Reaction 2 : zinc added to 2.0 mol/dm^3 sulfuric acid

What is the same for reactions 1 and 2?

A average rate of evolution of gas
B initial reaction rate
C total mass of hydrogen formed
D total reaction time

Answers

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Q1 D

Q2 B

Q3 B

Q4 B

Q5 C

Q6 B

Q7 D

Q8 C

Q9 C

Q10 C